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facts through the medium of related physical facts, and add precision to the results of introspection. Thus does the author, after standing so valiantly against it, fall captive at last to the psychologist's fallacy. Psychical facts are such only as they are revealed in inner experience; to infer them from the results of physical measurement is false logic, and any precision gained in thus supplementing the results of introspection is factitious. The example of brightness contrast, adduced by the author in this connection, is far from convincing. Measurements of the contrast effect do not contribute in the least towards a description of consciousness, but merely state more precisely the relation between the contrast effect and its physical conditions. What quantitative psychology is concerned with is, indeed, not the description of consciousness, but something which is probably of much more importance, namely, the causal relations subsisting between mental events and their physical conditions and consequences. Cause and effect are on the whole a more important study than morphology; and so far from the use of quantitative psychology being the furtherance of the description of consciousness, it will probably in time be recognized that the main value of descriptive psychology lies in its contribution toward the discovery of causal laws which overpass the bounds of the psychical. This is not psychology, will be the retort. But psychology, after all, is what we make it.

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L'Attention spontanée dans la vie ordinaire et ses applications pratiques.

ROERICH. *Revue Philosophique*, August, 1906. Pp. 136-159.

With the following statement giving the limitations of his discussion, M. Roerich begins his subject: "Spontaneous or primary attention is distinguished from voluntary attention in this, that while in the former the subject becomes attentive through the force of an impression or the suggestion of an idea from without, in the latter the subject becomes attentive through a process of conscious initiative and contingent choice" (p. 136). There are two aspects in this kind of attention, which may be called the primary and the apperceptive. "Primary attention is the effort by which we try to know more fully a fact or an object which vividly impresses our sense-organs, to satisfy ourselves with those aspects of the situation which have stimulated the organism" (p. 136). This is well illustrated by our reactions to a cannon shot, a light, a blow, sufficiently strong to rouse us from a state of indifference. In a similar manner a very weak sound, an indistinct light, a sigh, may excite our attention. As the author insists, primary attention is usually mixed with other forms of attention, and any treatment of it as such must be, therefore, a logical one.

In a number of interesting examples M. Roerich shows the function of primary attention in practical life. I shall give only one. Suppose a man, lost in a deserted field, to see a light in the distance. What can it be? He proceeds to investigate and pass judgment just as does a scien-

tist in the laboratory. He sees whether the light moves or not, whether it grows brighter or dimmer, whether it is accompanied by any voice, noise, barking of a dog, rolling of a carriage, etc. He adjusts his actions accordingly. His first stimulation is an example of primary attention. His mental operations after such stimulation show the working of apperceptive attention.

As regards the pragmatic aspects of primary attention we may distinguish laws of attention from rules of attention. The basic laws of primary attention as scientifically determined are the following:

"I. If the subject is attentive, the reaction time is very short. If the subject is inattentive (which is the case in involuntary attention), the reaction which the impression excites takes a much longer time" (p. 141).

"II. There is no such thing as voluntary attention sustained for more than a few seconds at a time. What is called sustained voluntary attention is a repetition of successive efforts which bring back the topic to the mind. . . . No one can possibly attend continuously to an object that does not change"¹ (p. 141).

"III. A certain period of time is necessary between changing perceptions in order to allow the judgment to operate upon them. If the time is too long the perceptions become isolated and are effaced. If the time is too short the perceptions become confused and the attention can not seize them with sufficient ease" (pp. 141-142).

The maxims or rules resulting are the following:

"I. To rouse the primary attention and make it persist, the impressions which follow one another must be graded either in intensity or in vividness" (p. 142). For example, a lecturer should not use a monotonous tone, but should vary his words in pitch, intensity, inflection, etc.

"II. The regular repetition of the same impression or of similar impressions will not rouse the attention unless there is between the successive impressions a period of time which is neither too long nor too short" (p. 142). The series of slides in a stereopticon exhibit would thus demand a proper spacing, as it were, in the showing.

"III. To rouse the attention, an object must be clearly and distinctly presented" (p. 142).

"IV. Only those impressions of dissimilar nature can be associated which belong to the same object" (p. 143).

"V. It is by contrast of successive or simultaneous impressions that primary attention is most surely excited" (p. 143).

Concerning apperceptive attention we may consider it as due to ideation of a 'preperceptive' nature, to use the expression of Lewes. "It is a special form of spontaneous attention which is roused by the appearance of a new impression or idea among those previously acquired" (p. 144). The appearance of such a new impression is well illustrated by the entering of a new comet into an astronomer's horizon. This is at once apperceived by him, though to the general observer it might remain unnoticed. Similarly the absence of some familiar impression will also rouse the

¹The author takes this from James, 'Principles of Psychology,' II., p. 420.

attention. When a shepherd assembles his flock, if there be one missing he will apperceive it almost intuitively. He does not need to recount his flock. It is as if a ring in a chain were suddenly removed. In either case certain acquired ideation masses are necessary.

Rabelais and Rousseau knew well how to utilize these forms of attention. So, too, Cicero in his orations and Cæsar in his political manipulations made use of them. And in modern fiction the skillful novelist does not present his moral. He gives his facts and then leaves the reader to form the conclusion, to construct the moral himself. There is use made of the reader's ideation masses, if he has any.

As above, M. Roerich gives a law for apperceptive attention and also a number of rules. We have but a single law.

"In every moment of consciousness which is not under voluntary guidance the accuracy and the rapidity of the conscious states increase in proportion to the extent, variety and proper coordination of the associated ideas" (p. 151).

The following rules result:

"I. In order to get apperceptive attention it is not necessary that the presentation be new, provided it appear in a new form" (p. 152). Thus Phédre, Iphigenia, Orestes, Achilles, etc., are historical personages with whom all are familiar. But how well are they presented by Racine, Glück, Goethe?

"II. To facilitate apperception, the new presentation should resemble the acquired ideas, though it need not be identical with them" (p. 153).

"III. The new presentations should be connected with the old by a series of graded transitions, which result in successive stages of distinctness and clearness" (p. 154).

"IV. Between two culminating points in apperceptive attention there should be a period of deliberation and judgment" (p. 156). Such a period is necessary to allow of proper assimilation and ideal coordination. Time for rest and recuperation is also necessary to prevent fatigue.

The account given by M. Roerich is an excellent one. Though he does not bring out the motor aspects of attention, still he makes up for this by emphasizing its pragmatic aspects. Psychologists too often are like the people,

"— that dwell up in the steeple,
All alone,
And who, tolling, tolling, tolling,
In that muffled monotone,
Feel a glory in so rolling
On the human heart a stone."

It is refreshing when one comes out of his shell and applies his science to concrete situations, tests his theories by fitting them to the world about him. M. Roerich has made a creditable endeavor in this direction.

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